Incisions and Wound Healing

SFC Glover

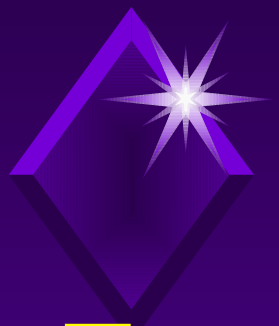
OBJECTIVE

Terminal Learning Objective (TLO). Discuss incisions, wounds, and wound healing including the definitions, anatomy, wound classifications, the healing process, and potential complications of healing IAW cited references.

Definitions

Surgical incision - A cut made intentionally through intact skin with a knife, blade, or scalpel in surgery.

Wound - Injury to body tissues, either accidental (due to trauma) or intentional (a surgical incision).



Traumatic wounds - Not planned; due to injury.

Chronic wounds - Long term; happens over time due to disease or pressure.

Granulation tissue - Tissue that forms in open wounds.

Collagen - Protein substance formed during wound healing; gives wound strength.

Adhesion - Scar tissue that holds or unites surfaces or structures together that are normally separated.

Debridement - Removal of damaged tissue and debris from a wound to promote healing and prevent infection.

Criteria For Selection of Incision Sites

Based on several factors:

Elective or emergency procedure.

Best exposure of the target organor area.

Which will cause the least postoperative discomfort.

Which site, when closed, will be the strongest.

Which can be made with the least tissue trauma and will produce the best cosmetic result.

Named for direction and location

Direction -

Vertical

Horizontal

Oblique

LOCATION

Midline Incisions

Above the umbilicus - Stomach, duodenum, and the pancreas.

Below the umbilicus - Uterus and the bladder.

Paramedian Incisions

Upper incision - Stomach, duodenum, and the pancreas.

Lower incision - Pelvic structures and the colon.

Oblique Incision - Inguinal hernia repair.

Sternal Incision (Median sternotomy)- Heart, lungs, and access to the lower cervical and upper thoracic vertebrae.

Lateral Thoracotomy Incision - Lung.

Transverse- Uterus, Ovaries, and tubes.

McBurney Incision - Appendix.

Subcostal Incisions - Rt side -Gallbladder, and billary system. Lt side - Spleen.

Pfannenstiel Incisions - (Transverse)

Lower abdomen - Uterus, ovaries, and tubes.

Upper incision - Dr’s preference.

Anatomy of Surgical Incisions

Abdominal incisions

- Skin
- Subcutaneous tissue
- Fascia
- Muscle
- Peritoneum

Anatomical layers on other parts of the body

Orthopedic Surgery

- Periosteum
- Synovial membrane
- Cartilage
- Ligaments
- Muscle
- Tendons

Cranial Surgery.

- Skin
- Subcutaneous Tissue
- Galea (fascia)
- Skull
- Meninges (dura)
- Dura mater (tough)
- Arachnoid (middle)
- Pia mater (delicate)

Layers of the eye:

Cornea

Sclera

Choroid

Retina

Heart Surgery:

- Pericardium
- Myocardium
- Pleura - two layers

Wound Closure Principles

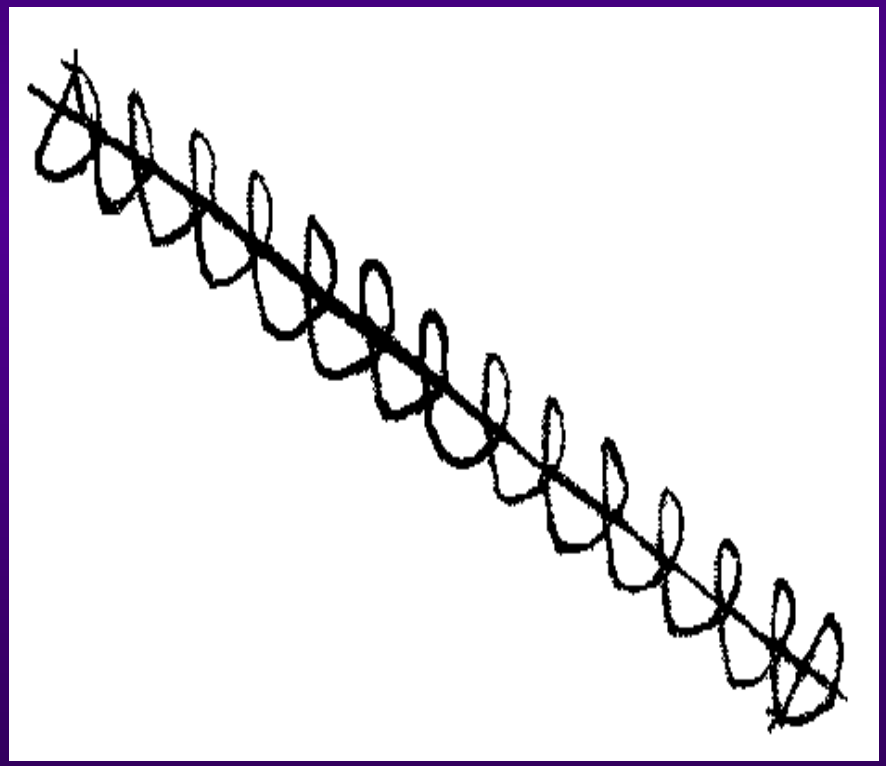
Close in opposite order

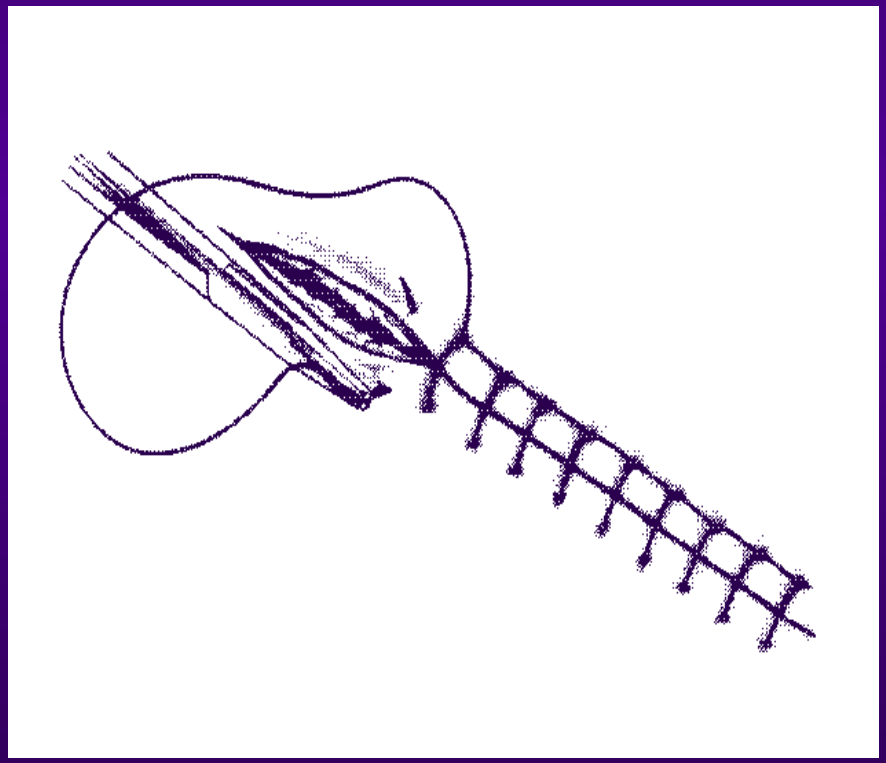
Close in correct anatomical order

Close layers that provide strength (i.e. skin/ fascia)

Ensure stitches are not to tight

Stitches- continuous or interrupted





Healing

Definition - Repair and restoration of injured tissue.

Three Types of Healing

Primary Intention - Staples or sutures

Secondary Intention - Left open to heal from the inside out.

Third Intention - Delayed Primary Closure.

CBRNE - Chemical, Biological, Radiological, Nuclear, and Explosive

CAUTION: Blast wounds are not closed, primarily, due to the high levels of contamination.

Combined radiological injured patients that are left open and allowed to heal by secondary intention should be closed within 36 to 48 hours of

Stages of Wound Healing

Inflammatory Phase

Fibroplastic or Proliferate Phase

Maturation or Remodeling Phase

Factors that Influence Healing

General Health

Smoking

Nutrition

Immune System

Weight

Surgical Technique

Complications of Healing

Scar Formation:

- Hypertrophic Scars
- Contractures Scars
- Keloid Formation
- Adhesions

Wound Disruption:

Dehiscence

Evisceration

Surgical Wound Classifications

Class I - clean wounds, infection rate 1-5%

Ideal surgical conditions:

GI, GU and respiratory tract not entered

Class II - clean-contaminated wounds, infection rate 8-11%

Minor break in sterile technique.

GI, GU, respiratory tract under controlled circumstances.

Class III - contaminated wounds, infection rate 15 - 20%

Open traumatic wounds < 4 hours

Major break in sterile technique

Inflammation, w/o pus

Spillage from GI or GU tract

Class IV - dirty and infected wounds, infection rate 27 - 40%

Traumatic wounds > 4 hours old

Infection or perforated bowel

Questions?